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In the application of:

Robert BARHAM and David JOYNT.

Serial No.: 09/869,002

Filing Date: June 22, 2001

Examiner: C. Collins

Group Art Unit: 1638

For: HEAT TOLERANT BROCCOLI

### DECLARATION OF ROBERT BARHAM

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

I, Robert Barham, declare as follows:

1. I, Robert Barham, an officer and owner of R&D Ag Inc., a Chapter S corporation within the state of California, work alongside my partner David Joynt, in our continued effort to develop new and novel broccoli varieties.

2. I am a co-inventor of the invention disclosed in the above referenced patent application, and am familiar with the contents thereof. I have assigned my rights in the invention to the R&D Ag Inc., of which I am a co-owner, and stand to receive remuneration from R&D Ag Inc., in connection with the invention pursuant to my services with and co-ownership interest in R&D Ag Inc.

3. I am a commercial plant breeder by profession. I received my B. S. degree in Genetics from UC Davis in 1975, M. S. in Agronomy at UC Davis in 1977, and PhD in Plant Breeding and Plant Genetics from the University of Minnesota in 1979. From 1979 to 1989 I worked for Northrup King Company as a commercial vegetable breeder specializing in *Brassicacea* species including cabbage, cauliflower, broccoli, and radish. From 1989 on, I have been actively breeding broccoli. It was at R&D Ag where we established the invention of heat-tolerant broccoli and continue to improve upon it through the present. With my background in Broccoli seed production, vegetable crop production, and general agricultural know how, I am familiar with all aspects needed in the development, production, and marketing of new plant varieties.

4. The following is a representative example of our breeding of different lines of broccoli to generate heat tolerant broccoli.

Year Broccoli Breeding History (Heat Stress numbers are in parenthesis)

Green Belt (3.1) X Marathon (2.1) Shogun Type  
 (2.0) X IMF 608 (1.8)

IMF 608 (1.8) X Cruiser (4.5)  
 F<sub>1</sub> X F<sub>1</sub>

↓ IMF 608 (1.8) X Cruiser (4.5)

↓ 1990 90-282 (7) 990 (Grown in winter)

↓ 1991 90-282 (7.5) 2544 (Grown in winter)

↓ 1992 90-282 (Good) 3510-1 (Grown in winter)

↓ 1993 90-282 (NR) 4030-1 (Grown in winter)

↓ 1994 90-282 (5) 5076 (Grown in winter)

↓ 1995 90-282 (4.5) X 95-5804 (4.5)

↓ 1996 96-7146-1 (6)

↓ 1997 97-1413-3 (NR)

↓ 1998 98-2329-3-1 (6.5)

↓1999	99-4329-2 (7)
↓2000	RD5474 (7) - Stable line
↓2001	RD5474 (7)
2002	RD5474 (7)

5. The above breeding history shows how the heat tolerance develops as we select for it year after year as described in our application until we have a stable line.

6. David Joynt and I have continued our heat tolerant broccoli breeding program and currently have been crossing various heat tolerant lines that we have developed to other commercial broccoli lines to introduce heat tolerance into those commercial lines. The following breeding histories are representative of the success that we have had generating heat tolerant hybrids in only a few generations

Year	Broccoli Breeding History #1			
	↓			
	↓			
	↓			
	↓1999	99-4295-2	HT = 7.2	
2000		20-5439	X	Syn 619 HT = 4.5
2001			F <sub>1</sub>	HT = 6.5
2002		F <sub>2</sub> :	02-3650-6	HT = 6.9
2003		F <sub>3</sub> :	03-8756-1	HT = 7.1

Year	Broccoli Breeding History #2			
↓				
↓2001	01-6432	X	Syn 619	HT = 4.5
2002	F <sub>1</sub>			
2003	F <sub>2</sub> :	8789-1	HT = 6.5	

Year	Broccoli Breeding History #3			
↓				
↓2001	6278	X	Syn 619	HT = 4.5
2002	F	3565-1 <sub>1</sub>	HT = 6.5	
2003	F <sub>2</sub> :	8789-1	HT = 7	

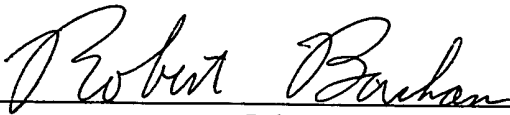
The maximum temperatures of the summer growing season are indicated on attached Exhibits A, B, and C.

7. It is my opinion that a broccoli breeder could use the techniques that we disclosed in our patent application to generate heat tolerant broccoli starting with a wide range of broccoli lines. Even broccoli lines with no heat tolerance characteristics may be used either by crossing with the starting lines disclosed in our patent application and breeding for heat tolerance as we described in our patent application or by crossing a heat tolerant line generated by our methods with a non-heat tolerant line and breeding for heat tolerance using conventional breeding techniques.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the

like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

November 19,  
2003

  
Robert Barham



PATENT  
Docket No. 500852000101

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the application of:

Robert BARHAM and David JOYNT.

Serial No.: 09/869,002

Filing Date: June 22, 2001

For: HEAT TOLERANT BROCCOLI

Examiner: C. Collins

Group Art Unit: 1638

**DECLARATION OF DAVID JOYNT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

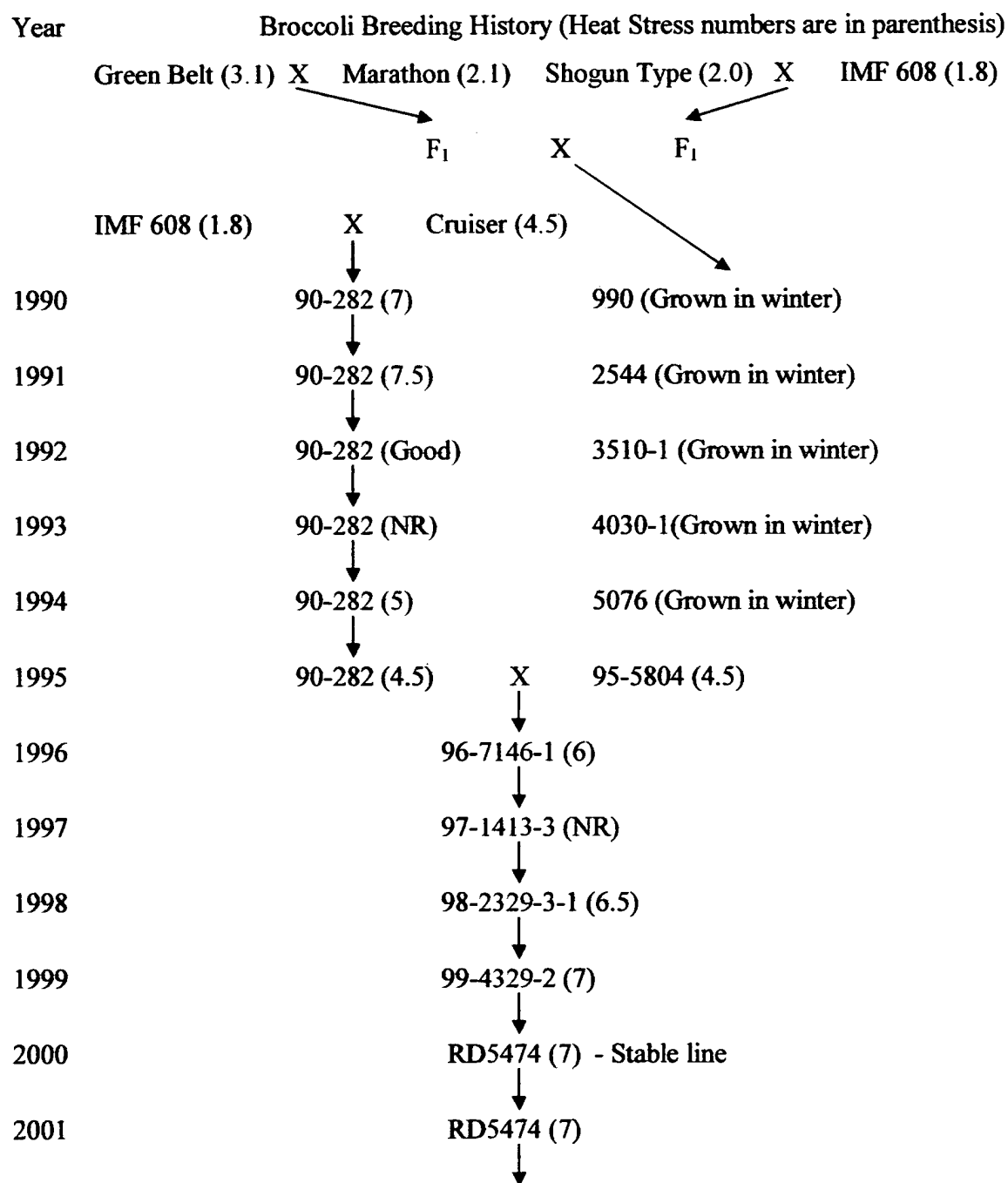
Dear Sir:

I, David Joynt, declare as follows:

1. I, David Joynt, an officer and owner of R&D Ag Inc., a Chapter S corporation within the state of California, work alongside my partner Dr. Robert Barham Ph.D., in our continued effort to develop new and novel broccoli varieties. With my background in Brassica seed production, vegetable crop production, and general agricultural know how, I am familiar with all aspects needed in the development, production and marketing of new plant varieties.
2. I am a co-inventor of the invention disclosed in the above referenced patent application, and am familiar with the contents thereof. I have assigned my rights in the invention to the R&D Ag Inc., of which I am a co-owner, and stand to receive remuneration from R&D Ag Inc., in connection with the invention pursuant to my services with and co-ownership interest in R&D Ag Inc..
3. I hold a BS degree in Agricultural Entomology, from the University of California at Davis having graduated in 1977. I have been actively involved in the breeding of heat tolerant

broccoli since 1993 as co-owner of R&D Ag Inc and consulted with Dr. Robert Barham in the developmental stages of heat tolerance during his work at Barham Seed Inc.. I have worked in Brassica seed production and development since 1985. Between graduation from Davis and working in the seed industry I was involved in commercial agriculture and crop production.

4. The following is a representative example of our breeding of different lines of broccoli to generate heat tolerant broccoli.



5. The above breeding history shows how the heat tolerance develops as we select for it year after year as described in our application until we have a stable line.

6. Robert Barham and I have continued our heat tolerant broccoli breeding program and currently have been crossing various heat tolerant lines that we have developed to other commercial broccoli lines to introduce heat tolerance into those commercial lines. The following breeding histories are representative of the success that we have had generating heat tolerant hybrids in only a few generations

Year	Broccoli Breeding History #1			
1999	99-4295-2	HT = 7.2		
	↓			
2000	20-5439	X	Syn 619	HT = 4.5
	↓			
2001		F <sub>1</sub>		HT = 6.5
	↓			
2002	F <sub>2</sub> :	02-3650-6		HT = 6.9
	↓			
2003	F <sub>3</sub> :	03-8756-1		HT = 7.1

Year	Broccoli Breeding History #2			
2001	01-6432	X	Syn 619	HT = 4.5
	↓			
2002		F <sub>1</sub>		
	↓			
2003	F <sub>2</sub> :	8789-1		HT = 6.5

Year	Broccoli Breeding History #3			
2001	6278	X	Syn 619	HT = 4.5
	↓			
2002	F	3565-1 <sub>1</sub>		HT = 6.5
	↓			
2003	F <sub>2</sub> :	8789-1		HT = 7

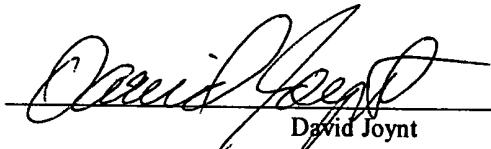


The maximum temperatures of the summer growing season are indicated on attached Exhibits A, B, and C.

7. It is my opinion that a broccoli breeder could breed heat tolerant broccoli with pretty much any traits normally found in broccoli. The starting broccoli for the breeding program is not important. We included in the patent application examples of different starting broccoli that could be used in breeding for heat tolerance. I expect that many other varieties could be used to generate heat tolerant broccoli. After a breeder has bred one heat tolerant broccoli, it could be crossed to any other broccoli to yield a heat tolerant hybrid in only a few generations. The example pedigrees above show crossing three different heat tolerant varieties that we have generated crossed to a normal broccoli. Within three years, we had three different heat tolerant hybrids. Thus, a breeder could take a heat tolerant broccoli and cross it to any other broccoli such as a broccoli with short branching habit good for crown cut and bunched broccoli. In a few seasons of breeding, the breeder can have a heat tolerant broccoli with short branching habit.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

November 19, 2003

  
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David Joynt